Auction House Price Analysis

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Updated Proposal

- Analysis techniques to find predictable characteristics of Auction House
  - Correlation between Craftable Items and Materials
  - Regression of Weekly/Daily Trends
  - Behavior of Highest Volatility Items
  - Explanations for Outliers (Random or Patch/Event Based?)

Checkpoint

- Deployed Data Collection Script & Set up AWS postgres database
- Collected >1 month worth of price data
- Correlation Analysis between craftable "Best-in-Slot" (BiS) items and materials
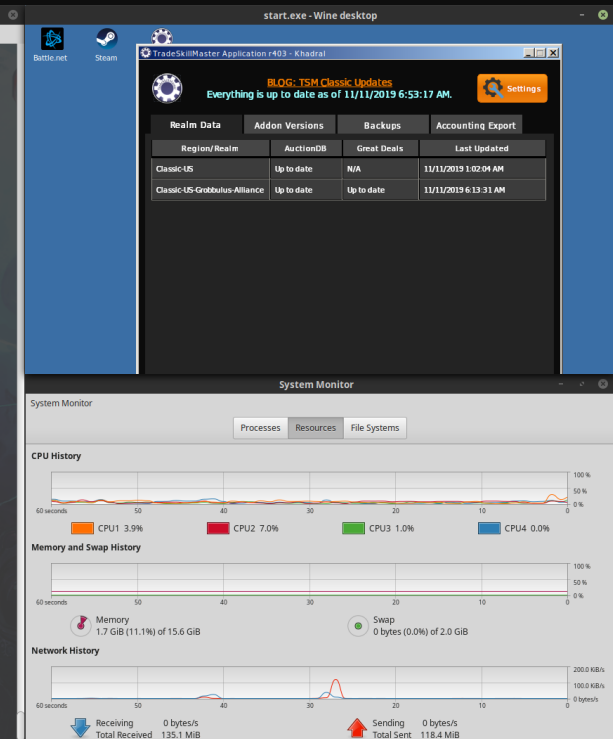- Began Weekly Trend Analysis
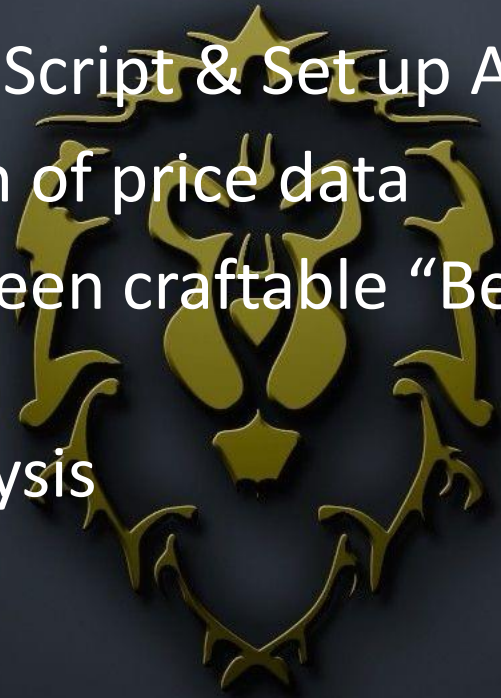
Data Collection

- Script perpetually running on Linux server

- Scans TradeSkillMaster data file every second – AppData.lua

- If update to file, parses and preprocesses data (JSON format)
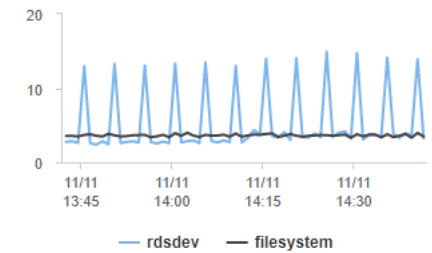
- Pushes processed data to AWS server

AWS Database

- ~695 scans over 34 days

- 5878 Items

- Attributes: itemid, marketvalue, minbuyout, historical, numauctions, scantime

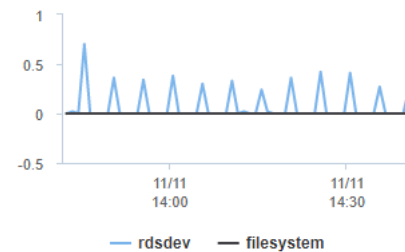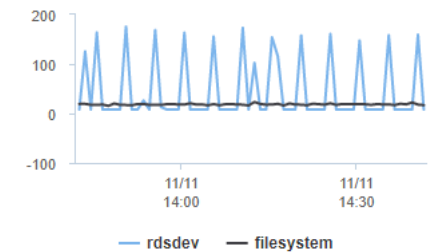 - Mostly concerned with itemid, minbuyout, and numauctions so far

BiS Correlation

	green_lens	thick_leather	jade	aquamarine	heart_of_the_wild	wildvine
green_lens	1	0.110703	-0.0272423	-0.0958198	0.0312497	0.159657
thick_leather	0.110703	1	-0.0556212	-0.132475	0.0891398	0.00706112
jade	-0.0272423	-0.0556212	1	0.0577377	-0.00712425	-0.0633871
aquamarine	-0.0958198	-0.132475	0.0577377	1	0.0372341	0.0753741
heart_of_the_wild	0.0312497	0.0891398	-0.00712425	0.0372341	1	0.0124691
wildvine	0.159657	0.00706112	-0.0633871	0.0753741	0.0124691	1

	devilsaur_gauntlets	rugged_leather	devilsaur_leather	rune_thread
devilsaur_gauntlets	1	0.0550622	0.475571	0.105766
rugged_leather	0.0550622	1	0.0304922	-0.104884
devilsaur_leather	0.475571	0.0304922	1	0.115137
rune_thread	0.105766	-0.104884	0.115137	1
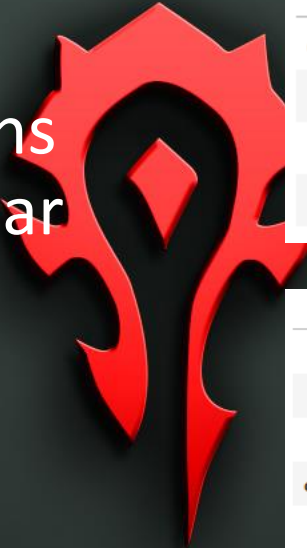
	devilsaur_leggings	rugged_leather	devilsaur_leather	cured_rugged_hide	rune_thread
devilsaur_leggings	1	0.0784299	0.427669	0.300431	0.0573405
rugged_leather	0.0784299	1	0.0304922	0.231806	-0.104884
devilsaur_leather	0.427669	0.0304922	1	0.381772	0.115137
cured_rugged_hide	0.300431	0.231806	0.381772	1	-0.0226036
rune_thread	0.0573405	-0.104884	0.115137	-0.0226036	1

- Correlations for Green Lens, Devilsaur Gauntlets, and Devilsaur Leggings
- Problem – BiS are difficult to make → low qty, little data
- Conclusion – Very low correlation between materials and items
- Highest correlation is Devilsaur Leather & the items it creates, however, still low (~.45)

BiS Correlation – Interesting Discovery

- Both Devilsaur Gauntlets & Devilsaur Leggings correlations to Devilsaur Leather are similar

- Strong correlation between Devilsaur Gauntlets and Devilsaur Leggings

- Why is this correlation strong? Is there a trend in the pricing?

|	devilsaur_gauntlets	rugged_leather	devilsaur_leather	rune_thread
devilsaur_gauntlets	1	0.0550622	0.475571	0.105766
rugged_leather	0.0550622	1	0.0304922	-0.104884
devilsaur_leather	0.475571	0.0304922	1	0.115137
rune_thread	0.105766	-0.104884	0.115137	1

	devilsaur_leggings	rugged_leather	devilsaur_leather	cured_rugged_hide	rune_thread
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rune_thread	0.0573405	-0.104884	0.115137	-0.0226036	1

	devilsaur_gauntlets	devilsaur_leggings	devilsaur_leather
devilsaur_gauntlets	1	0.520048	0.475571
devilsaur_leggings	0.520048	1	0.427669
devilsaur_leather	0.475571	0.427669	1

# Weekly Trend – Large Radiant Shard

- Item used for high level enchanting

- High Trading Price and High Volatility

- Prices have fluctuated rapidly over the past month

- Outliers – Decided to remove, as only seen during 1 event between 10/25-10/26

Large Radient Shard Price Trend between 10-7-2019 and 11-11-2019

Large Radient Shard Price Range
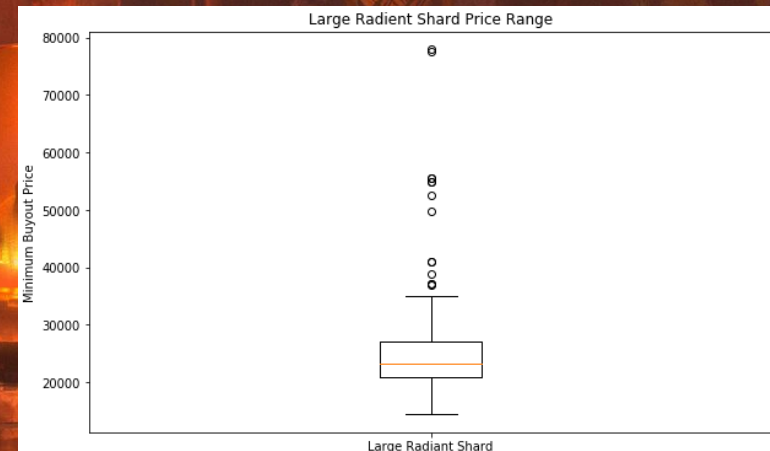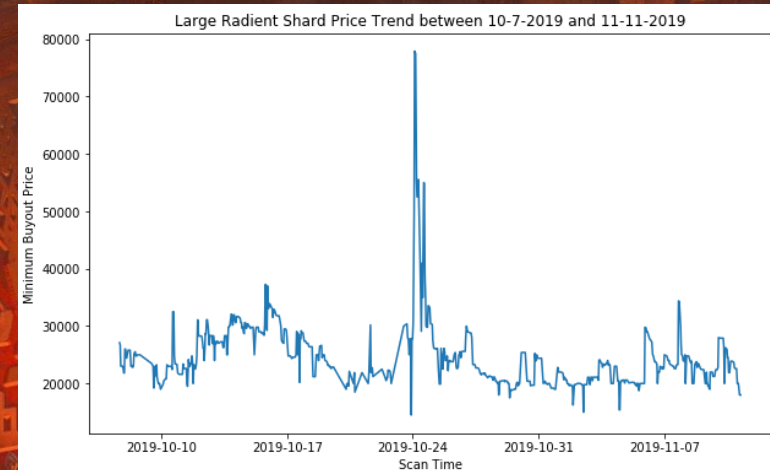
Weekly Trend – Large Radiant Shard

- See a slight variation in prices throughout the week
  - Wed & Thurs visually look to be the highest
  - Friday & Weekend looks to be lower on avg
- No apparent trend from Five Number Summary of each weekday
- Which regression model is best? Linear? Quadratic? Cubic?
- Is there a justifiable slope?

	min	q1	median	q3	max
Mon	15400.0	20400.0	21835.0	28743.25	32000.0
Tues	17499.0	20000.0	22000.0	25799.00	33063.0
Wed	14500.0	22000.0	25000.0	28957.00	33908.0
Thurs	19000.0	21700.0	23999.0	28080.00	34999.0
Fri	16250.0	21599.0	23400.0	25000.00	30300.0
Sat	15000.0	21100.0	22900.0	25600.00	31100.0
Sun	18500.0	22309.5	23759.0	27263.00	32099.0

Scatter Plot of Large Radiant Shard Prices Seperated by Weekday
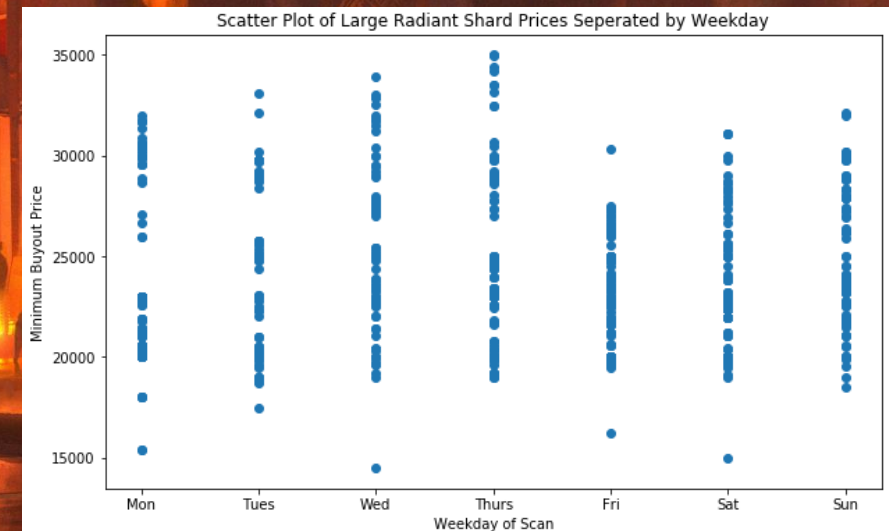
Future Analysis

- Deeper Dive into Devilsaur Leather Craftables
  - Are prices of items event/patch related?
  - Is there a definable trend?
- Correlations between other craftables and materials (Consumables & Containers)
- Further Regression Analysis on Large Radiant Shard
  - Is there a justifiable slope? Linear? Quadratic? Cubic?
- Search for & Analysis on highest volatility items
  - Are the price fluctuations on these items predictable?
- Causes of price outliers? Are they patch/event related or purely random?